

GANPAT UNIVERSITY										
FACULTY OF ENGINEERING & TECHNOLOGY										
Programme	Bachelor of Technology				Branch/Spec.		Civil Engineering			
Semester	II				Version		1.0.0.0			
Effective from Academic Year	2026-27				Effective from the batch admitted in		July 2026			
Course Code	2ESC1109				Course Name		Critical Thinking, Design Thinking, Leadership and Teamwork			
Course Category	Engineering Science Courses (ESC)									
Teaching & Learning Scheme							Examination scheme (Marks)			
	L	TU	P	Total	SL	TSL		CE	SEE	Total
Credit	2	0	1	3	30	90	Theory	50	50	100
Hours (per week)	2	0	2	4			Practical	25	25	50
L: Lecture, TU: Tutorial, P: Practical/Lab., SL: Minimum Self-Learning or Term Work Hours per Semester, TSL: Minimum Total Teaching & Self-Learning Hours per Semester, CE: Continuous Evaluation, SEE: Semester End Examination.										
Pre-requisites:										
Basic Math and Logical Reasoning										
Course Outcomes										
COs	Description									
CO1	Apply design thinking frameworks, empathy techniques, and creativity tools to solve complex problems, develop innovative solutions, and design professional, technical, and industrial projects.									
CO2	Analyze creativity, innovation, and product development processes by integrating design thinking with agile models, prototyping, UX design, and value proposition development.									
CO3	Evaluate arguments, data, and real-world situations using critical thinking models, logical reasoning, decision-making principles, and case-study analysis.									
CO4	Demonstrate effective leadership, teamwork, and communication skills by applying emotional intelligence, conflict resolution strategies, and verbal and non-verbal communication techniques.									
Theory Syllabus										
Unit	Content									Hours
1	Design Thinking Fundamentals and Framework: Fundamentals of Design Thinking, Design Thinking for complex problem solving, 7-stages of Design Thinking, Exploring solution space(C-K Theory) , Techniques of Empathy building, Empathy maps and user journey mapping, Integration of Design Thinking and Storyboarding, Design Thinking practicing case-studies, Design Thinking for Professional Skills, Design Thinking practices for Coding skill, Co-curricular skill, Technical blog writing, Designing Capstone projects, Design Thinking in industrial projects, Strategy for new technology innovations.									6
2	Design Thinking in Creativity & Innovation: Unique characteristics of Design Thinking, Difference between Creativity and Innovation, Categories and misconceptions of creativity, Resilience in problem-solving, Analytical Thinking – Driven by Design Thinking, Waterfall models and Design Thinking, Agile Development models, Agile process integrated with Design Thinking, Design Thinking based Product development - Design methodology, Prototyping, UX design, Value proposition.									6
3	Critical Thinking: Introduction to Critical Thinking, Styles and challenges of Critical Thinking, Benefits of Critical Thinking, Identifying & clarifying issues and arguments, Types of Arguments, Common patterns of Deductive reasoning & Inductive reasoning, Reasoning with Statistics, Fallacies of Relevance, Fallacies of Insufficient Evidence, Evaluating									6

	arguments, Critical Thinking models, Principles of Decision making, De Bono's Thinking hats, Effective Argument Writing, Critical Thinking based case study analysis, Analytical view of Science & Pseudoscience based thinking	
4	Leadership and Teamwork: Defining leaders and leadership, Types of leaders and leadership styles, Understanding the people, personalities and abilities, Active listening, Non - verbal communication, Feedback, Clarity, Effective teams, Stages of team development, Understanding the psychology of change for individuals and teams, Personal resilience and well- being, Feedback and feed forward, Leaders and teams: Working effectively towards common goals, Role of integrity in leadership, Embracing growth mind-set in leadership, Conflict resolution and Managing team dynamics.	6
5	Verbal and Non-verbal Communication: Verbal and non-verbal communication, LSRW skills, Assertive communication, Persuasion Skills, Interpersonal Skills, Cross-cultural communication, Emotional intelligence, Self-awareness, Interpreting body language, Active listening, Personality development, Time management, and Goal setting.	6
Practical and Self Learning Content		
Practical, assignments, quiz, and tutorials are based on the above syllabus.		
Text Books		
1	Thinking Skills - Critical Thinking and Problem Solving” by Geoff Thwaites and John Butterworth	
2	Critical Thinking A Student's Introduction” by Gregory Bassham William Irwin, Henry Nardone, James M. Wallace	
Reference Books		
1	Leadership: Theory and Practice" by Peter G. Northouse	
2	Innovation and Entrepreneurship" by Peter F. Drucker	
3	Critical Thinking: Tools for Taking Charge of Your Learning and Your Life" by Richard Paul and Linda Elder	
4	The 7 Habits of Highly Effective People" by Stephen R. Covey	
5	Design Thinking: Understanding How Designers Think and Work" by Nigel Cross	
ICT/MOOCs Reference		
1	eBook: "The Innovator's Dilemma" by Clayton Christensen Online Resource: Harvard Business Review's Innovation section (https://hbr.org/topic/innovation)	
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Mapping of COs, POs, and PSOs														
COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	2	3	0	1	1	0	1	1	1	2	2	3	2
CO2	1	3	3	0	1	1	0	1	1	1	2	2	2	1
CO3	1	3	2	0	0	0	0	1	2	0	2	3	2	2
CO4	0	1	1	0	0	0	1	3	3	2	2	1	3	2

Bloom's Taxonomy Level				
Unit	Unit Title	Aligned COs	Learning Hours	BTL Level
1	Design Thinking Fundamentals and Framework	CO1	10	C
2	Design Thinking in Creativity & Innovation	CO2	7	C
3	Critical Thinking	CO3	10	E
4	Leadership and Teamwork	CO4	8	E
5	Verbal and Non-verbal Communication	CO4	10	N

Note:

- Version 1.0.0.0 (First Digit= New syllabus/Revision in Full Syllabus, Second Digit=Revision in Teaching Scheme, Third Digit=Revision in Exam Scheme, Forth Digit= Content Revision)
- 1 Hour Lecture = 1 Credit, 1 Hour Tutorial = 1 Credit, 2 Hours Practical = 1 Credit, 2 Hours Internship/Project/Seminar = 1 Credit
- As per NCrF/NEP 2020, Minimum Self-Learning or Term Work Hours per Semester should be calculated in such a way that 1 Credit should have minimum 30 Hours of Teaching and Self Learning Engagement per semester
- Bloom's Taxonomy Level (BTL) : R: Remember, U: Understand, A: Apply, N: Analyze, E: Evaluate, and C: Create